APPENDIX C
NREL ABOVE-GROUND STORAGE TANK GUIDELINES FOR CONSTRUCTION

a) All tanks must be designed and operated in accordance with NFPA 30 and the State of Colorado's Aboveground Storage Tank Regulations.

b) Tanks and piping must be designed and built and maintained (i.e. in good condition) in accordance with recognized good engineering standards for the material of construction, and must be of steel or other noncombustible material. It is recommended that all temporary AST's be FM or UL approved. If a non-FM or UL approved tank is used, all provisions of the Aboveground Storage Tank Management Plan must be met.

c) Tanks must be operated at atmospheric pressures. Liquid shall not be dispensed by gravity flow or pressurization of the tank.

d) All tanks and piping subject to corrosion must be properly protected (e.g. paint or cathodic protection) to ensure leaks do not occur. This includes tanks and piping placed upon the ground, a pad, or any steel, masonry, or concrete foundation or pipe/tank stand, as this is the location at which accelerated corrosion is most likely to occur. Bare steel tanks will not be allowed.

e) Tanks must rest on foundations or supports made of concrete, masonry, or steel. The foundations must be designed to minimize the possibility of uneven settling of the tank, and to minimize corrosion to any part of the tank resting on the foundation.

f) To protect from spills and overfills associated with product transfer to and from the AST system, the following protection methods must be used: fixed or movable equipment (reservoirs, pans, catchment basins, etc.) around the fill pipe or entire tank that will contain the release of product when the transfer hose is detached from the fill pipe or the tank is overfilled. Spills or overfills to the reservoir or catchment basin must be removed and cleaned-up immediately. Additionally, the transfer operator must be physically present to monitor the entire transfer process.

g) To prevent overfilling associated with product transfer to the AST system, available tank capacity must first be determined, and automatic or manual overfill prevention methods must be used (e.g. equipment that will automatically shut off flow into the tank when the tank is no more than 95 percent full, or a visual gauge of adequate accuracy and response time located near the AST system that is monitored by the transfer operator for the duration of the transfer process).

h) Tanks must be located in such a way as to minimize the danger of fire from the following ignition sources: open flames, smoking, hot surfaces, radiant heat,

cutting and welding, frictional heat or sparks, lightning, static electricity, electrical sparks, and stray currents. Provisions must also be made for the control of static electricity at installations where flammable or combustible liquids are transferred or dispensed.

i) Tanks must be located in such a way as to minimize the hazards associated with venting, releases, and fire to: buildings and their occupants, other tanks, roadways, pedestrian walkways, adjoining property, congested areas, waterways, streams, and ditches.

j) Tanks must be anchored, as necessary, to prevent blow-over in high winds.

k) Secondary containment is required for all AST's on NREL property . Should there be a catastrophic or undetected AST leak, secondary containment provides health and environmental protection. All secondary containment systems must be impervious to the tank contents for at least 72 hours (nonporous), compatible with the tank contents, resistant to normal environmental conditions (heat, cold, hail, ultraviolet (uv) radiation, etc.), of sufficient strength and durability to resist tearing, cracking, crumbling, eroding, collapsing, etc. for the operational lifetime of the tank, easily maintainable, of sufficient size to contain 110% of the volume of the tank (tank contents plus fire-fighting or rain water),of sufficient size to contain all critical piping, fittings, and valves (fill pipe, overfill pipe, spill protection equipment, etc.), and fitted with a normally closed valve or plug by which collected rainwater and tank product can be removed. The following permanent or temporary containment systems are allowed: steel catchment basins or spill skids, or earthen, masonry, or concrete berms when used in conjunction with an appropriate liner or coating ('visqueen' or other non-reinforced plastic sheeting with a thickness of 40 mils (0.75mm) or less is not appropriate).

l) At least one portable fire extinguisher with a minimum 20B:C rating must be within 25 feet of any tank containing a flammable or combustible liquid.

m) Emergency information (location of nearest telephone, dialing instructions, who to contact, equipment owner/area landlord etc.) must be placed between 10 and 50 feet from the tank.

n) All tanks must have a sign stating the tank contents and shall be marked in accordance with NFPA 704, Identification of Fire Hazards of Materials.

o) All tanks must have a locking mechanism to prevent vandalism and unauthorized additions or withdrawals.

p) All releases shall be reported in accordance with the NREL Spill Prevention and Control Plan. Any AST found to be leaking must immediately be repaired, replaced, or permanently closed.

FOR MORE INFORMATION:

- on NFPA standards, contact Mike Stewart at 275-3224.
- on all other AST requirements, contact John Eickhoff at 275-3217.

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